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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,934	12/22/2004	Kazuyuki Tohji	Q85487	1299
23373	7590	05/26/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			HAILEY, PATRICIA L	
			ART UNIT	PAPER NUMBER
			1755	

DATE MAILED: 05/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/518,934

Applicant(s)

TOHJI ET AL.

Examiner

Patricia L. Hailey

Art Unit

1755

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-23 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/07/06</u> . | 6) <input type="checkbox"/> Other: _____  |

Applicants' remarks and amendments, filed on March 7, 2006, have been carefully considered. No claims have been canceled or added; claims 1-23 remain pending in this application.

Support for the amendments to claims 1 and 8 can be found in the Specification at pages 9 and 11, fifth paragraphs on each page. Although the Specification recites the term "cavity", the word "void" is synonymous therewith.

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicants' Priority Document was filed on December 22, 2004.

***Maintained Rejection***

***Double Patenting***

2. *Claims 1 and 3-5 remain provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/507,895.*

Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are directed to photocatalysts comprising a capsule structure comprising a cadmium compound shell and a void, and further characterized by supporting platinum thereon.

The combination of claims 1 and 3-5 in the instant application reads upon that of claim 1 in the copending '895 application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

This rejection is maintained since Applicants "defer responding to the provisional obviousness-type double patenting rejection."

#### *Withdrawn Rejection*

The 102(b) rejection of claims 1-7 as being anticipated by Japanese Patent No. 10-310401, stated in the previous Office Action, has been withdrawn in view of Applicants' amendment to claim 1. The Japanese Patent discloses a semiconductor particle encapsulated by a polymer, which is opposite to that presently claimed.

#### *New Grounds of Rejection*

3. Applicant's arguments with respect to claims 1-8 and 10-23, as they were rejected in the previous Office Action, have been considered but are moot in view of the new ground(s) of rejection.

The following New Grounds of Rejection are being made in view of Applicants' amendments.

*Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. *Claims 1-3, 6-8, and 10-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirai et al. (U. S. Patent No. 6,051,614).*

Hirai et al. disclose a method for preparing a non-aqueous dispersion of metallic particles and/or metal compound particles, said particles being advantageously used for producing catalytic metals (col. 2, lines 50-56, of Hirai et al.; considered to read upon "photocatalyst").

The method involves obtaining aqueous dispersions of metal particles such as metal sulfides (e.g., sulfides of metals such as cadmium) by a conventional method in which an aqueous solution of a metal salt is treated with, for example, a sulfide-forming

agent. For example, cadmium sulfide can be obtained by treating an aqueous solution of a metal salt with agents such as sodium sulfide. Depending on what type of metallic particles and/or metal compound particles are desired to be obtained, agents such as sodium hydroxide (col. 5, line 32) may also be employed. See col. 4, line 66 to col. 5, line 35 of Hirai et al. (considered to read upon claims 8, 10, 12, 15, and 18).

Examples of the metal compound particles of the aqueous dispersion to be used in Patentees' invention include particles of metal hydroxides and oxides, e.g., those of metals such as cadmium. See col. 4, line 66 to col. 5, line 5 of Hirai et al. (considered to read upon claims 13 and 14).

Exemplary metal salts to be employed in Patentees' invention include halides, and nitrates. See col. 6, lines 6-10 of Hirai et al. (considered to read upon claims 15-17).

The particle size of the thus-obtained metal compound particles in the aqueous dispersion ranges from 1 nm to 3  $\mu\text{m}$  (3000 nm). See col. 5, lines 39-41 of Hirai et al.

Hirai et al. do not disclose that the particles exhibit a "cadmium compound shell and a void", or having pores "extending from its surface to its interior" (claims 1, 6, and 7).

However, because the references teaches methods for producing particles comparable to that instantly claimed, it would have been obvious to one of ordinary skill in the art at the time the invention was made to reasonably expect that the particles produced by the processes disclosed in Hirai et al. would exhibit a shell and a void, absent the showing of convincing evidence to the contrary.

7. *Claims 1-8, 12, and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buhler et al. (U. S. Patent No. 4,484,992).*

Buhler et al. disclose a catalyst comprising a cadmium sulfide/semiconductor powder, which is at least partially coated with a noble metal. See col. 2, lines 28-33 of Buhler et al.

Examples of the noble metal include platinum. See col. 3, lines 36-39 of Buhler et al.

The noble metal particles on the semiconductor powder preferably have a particle size ranging from 10 angstroms to 1000 angstroms (1 to 100 nm). See col. 3, lines 62 and 63 of Buhler et al.

Because Buhler et al. is considered to read upon claims 1-5 in their present form, the claim limitations recited in claims 6 and 7 (regarding the presence of pores) are considered encompassed by Buhler et al.

These disclosures are considered to read upon claims 1-7.

The catalyst can be prepared via any of a number of methods, such as by photocatalytic deposition of the metals on the semiconductor powders, advantageously with the addition of acid or salts thereof, in an aqueous solution or suspension of a suitable metal compound or a mixture of suitable metal compounds (col. 4, lines 40-46). See col. 4, line 40 to col. 5, line 66 of Buhler et al.; this disclosure is considered to read upon claims 8, 12, 19, and 20.

Patentees' catalyst is useful in a process for the selective production of hydrogen by means of heterogeneous photoredox catalysis by reacting, e.g., mixtures of water and alkali metal sulfites or sulfides under the action of light in a suspension of a cadmium sulfide/semiconductor (col. 2, lines 23-32), said reaction employing light sources such as sunlight, or any desired light having a wavelength, depending on the semiconductor, between approximately 200 and 650 nm. See col. 4, lines 15-27 of Buhler et al. (considered to read upon claims 21-23).

Although the reference does not specifically disclose a "shell and a void", the catalyst of Buhler et al. is considered to structurally read upon the claims in their present form.

It is well settled that when a claimed composition appears to be substantially the same as a composition disclosed in the prior art, the burden is properly upon the applicant to prove by way of tangible evidence that the prior art composition does not necessarily possess characteristics attributed to the CLAIMED composition. In re Spada, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Circ. 1990); In re Fitzgerald, 619 F.2d 67, 205 USPQ 594 (CCPA 1980); In re Swinehart, 439 F.2d 2109, 169 USPQ 226 (CCPA 1971).

#### *Allowable Subject Matter*

8. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.



The cited references do not teach or suggest the employment of sodium sulfite in making cadmium sulfide. Buhler et al. at col. 2, lines 23-32 disclose sodium sulfite as an exemplary reactant in the selective production of hydrogen.

### *Conclusion*

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Higo et al. (U. S. Patent No. 6,524,997) discloses a photocatalyst-bearing material comprising a carrier (e.g., a thermoplastic polymer) on which is borne and carried by fusion bonding particles. Examples of the particles include cadmium sulfide (col. 4, lines 45-49); these particles may also have their surfaces dotted or loaded with a metal such as platinum (col. 4, lines 62-64).

The size of the photocatalyst-bearing material "is not particularly limited, but may be set arbitrarily"; a disclosed average grain size may be from 0.1 mm to 30 mm (10,000 to 30,000,000 nm; see col. 3, lines 19-24).

Figure 3 of Higo et al. depicts an embodiment of Patentees' invention, in which a cavity exists in the central portion of the thermoplastic polymer to provide a hollow carrier having the photocatalyst particles loaded thereon.

This reference is considered to teach away from Applicants' claimed particle size of 100 nm or less.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

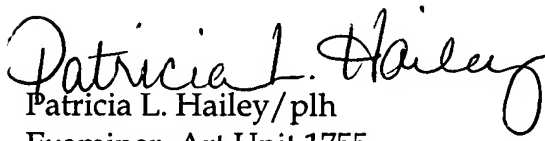
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia L. Hailey whose telephone number is (571) 272-1369. The examiner can normally be reached on Mondays-Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Patricia L. Hailey/plh  
Examiner, Art Unit 1755  
May 25, 2006

  
DAVID SAMPLE  
PRIMARY EXAMINER